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U.S. Cotton Production Practices and Costs

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ABSTRACT

This report summarizes cotton production practices and costs in the United States. Results show marked regional differences in cotton production practices and costs. Fertilizer and chemical inputs are major components of total cash expenses for producing cotton in the Southeast. Chemical inputs and irrigation are major cost items for cotton in the West. Most of the data were obtained from a survey of cotton producers in the major cotton producing regions.

Keywords: Cotton, production costs, production practices, production inputs.

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Data collection was handled by the Crop and Livestock Reporting Services of States included in the survey. Principal contributors to this effort included statisticians -in-charge of State offices, State supervisors, and enumerators.

Computer processing of the data, including production cost estimates, was provided through the Firm Enterprise Data System (FEDS) operated by the National Economics Division (NED) of the Economic Research Service (ERS). Contributors to this effort included Ronald D. Krenz, Gail D. Garst, and Tim Ulrich.

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SUMMARY

This report summarizes information on production practices and costs for the major cotton States and regions. The cost estimates are based in large measure on production practices and inputs from a 1982 USDA survey of producers in the major cotton States.

Total cash expenses for U.S. production averaged 54.5 cents per pound in 1982, compared with 53.1 cents a year earlier and 61.8 cents in 1983. These expenses reflect shortrun, out-of-pocket variable and fixed costs incurred on an average acre of cotton. An allowance for the replacement of machinery and equipment used in the production process added about 10 cents per pound to total cash expenses for U.S. production in 1983.

Substantial regional differences also occurred in cotton production costs. For example, total cash expenses for the period 1981-83 ranged from 54 cents per pound for the Delta region to 65.5 cents per pound for the Southeast. The differences in unit costs relate largely to variation in the mix and level of production inputs as well as variation in yields. For example, fertilizer and chemical inputs are major components of cash expenses in the Southeast while chemical inputs and irrigation are major cost items in the western cotton States. Yields are highly variable from year to year and among regions in a given year.

Machinery and equipment use in cotton production varies among States and regions. A large part of the variation in field operations can be attributed to regional differences in machinery use requirements for insect and weed control. Insect control tends to be a more severe problem in the Southeast than in other regions of the Cotton Belt.

Irrigation is an important practice in the western half of the Cotton Belt. Marked regional differences occur in irrigation methods and costs, depending on the source and availability of water. Sprinkler irrigation is the dominant method of irrigating cotton in the Southeast; gravity application dominates in the West.

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INTRODUCTION

Cost-of-production studies were first mandated by Congress in the Agriculture and Consumer Protection Act of 1973. Since enactment of this legislation, the Economic Research Service has conducted periodic cost-of-production surveys for major crop and livestock enterprises. A cost-of-production survey in 1982 conducted by the Economic Research Service (ERS) and Statistical Reporting Service (SRS) covered barley, corn, cotton, peanuts, sorghum, soybeans, and wheat. This report presents information on cotton from the 1982 survey.

The cost estimates and budgets presented in this report were initially developed by a cost estimating system known as the Firm Enterprise Data System (FEDS). 1/ The system primarily uses production inputs and practices data from the 1982 crops survey in the development of base budgets. These budgets are then updated by applying current prices, yields, and some updated input quantities. The surveys for cotton and other agricultural commodities have typically been conducted every fourth year for revising and updating the physical coefficients in the base budgets.

THE SAMPLE

A sample of farms was selected for each crop included in the 1982 survey. The procedure involved a systematic selection of sample units (farms) with probability of selection proportionate to size. This means that a large farm in terms of cotton acreage has a higher probability of selection than a smaller farm. The sampling procedure has the effect of selecting crop acres rather than farms. Thus inferences from this survey can be made only from the acreage universe from which the sample was drawn.

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1/ This system of budgets and cost estimating procedures is operated by ERS at Oklahoma State University. The budgets were processed by a redesigned version of the Oklahoma budget generator. The original Oklahoma budget generator was developed by Rodney L. Walker and Darrel D. Kletke.

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The cotton sample was drawn from a list of producers in the major cotton producing States. Cotton was sampled independently of other crops. Texas and Oklahoma cotton farms were divided into two groups: irrigated and nonirrigated. Data from the survey were weighted to provide representation of total cotton acreage. This procedure provides estimates from the survey which reflect data on an average acre of cotton.

GENERAL FARM CHARACTERISTICS

Farms vary significantly across the Cotton Belt with respect to land use, tenure arrangements, crop mix, and other characteristics. This section summarizes selected characteristics of sample farms included in the cotton survey. The data are presented by States within regions and for irrigated and nonirrigated cotton in Oklahoma and Texas. The data reflect totals/averages for the farms sampled. Thus, these per farm estimates would not be representative of all cotton farms in the State because the sample was designed to provide representative coverage of cotton acreage rather than cotton farms.

Land Tenure

The data in table 1 show land tenure patterns on the cotton farms surveyed in 1982. Share renting and cash renting of land for cotton production were common practices on the sample farms in all cotton regions. Share renting was the dominant practice in 1982 on the nonirrigated cotton farms in Texas and some Delta States; land owned by the operator or cash renting tend to prevail in other States (table 1).

Cash rental rates were substantially higher on average in Arizona and California than in the other major cotton States (table 2). Share rental rates varied among States in 1982, both in the landlord's share of expenses and product, and input items included in the share rental arrangement. Landowners also pay part of the irrigation costs on both cash and share rented land.

Cropland Use

Cotton and soybeans dominated cropland use on sample farms in the Southeast and Delta States (table 3). Cotton and small grains (mostly wheat) were the leading crops in Oklahoma for both irrigated and nonirrigated cotton farms. Cotton clearly dominated cropland use on sample farms in Texas, Arizona, and California. Feed grains (mostly grain sorghum) constituted a significant acreage in Texas. Rice is an important crop in the Mississippi Delta.

Solid planted cotton dominated planting patterns in most cases. The main exceptions were Alabama and the nonirrigated cotton in Texas where skiprow patterns were equally important (table 4). The results also show a significant acreage of cotton planted in skiprow patterns on sample farms in Louisiana and Mississippi.

Reduced Acreage Program

The Reduced Acreage Program (RAP) included a 15-percent acreage reduction provision for 1982 crop upland cotton. Although participation in the program was voluntary, producers not participating were ineligible for CCC loans and target price protection. The program required participants to devote their

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reduced acreage to conservation uses. The data in (table 5) show the proportion of sample farms participating in RAP and types of cover crops grown on this acreage.

Tractor Numbers and Use

Marked variation occurred in tractor numbers and use on cotton farms. For example, tractor numbers ranged from fewer than three tractors per farm on average in Oklahoma to more than seven tractors on Mississippi cotton farms (table 6). Annual average use of tractors ranged from slightly fewer than 500 hours in Alabama to over 1,000 hours in California. Diesel was the dominant tractor fuel used in all regions.

PRODUCTION INPUTS AND PRACTICES

This section provides information on production inputs and practices for cotton, including a description of irrigation systems and water use in cotton production.

Table 1—Tenure of land used for cotton production on farms sampled, 1982

State	Land tenure by type		
	Owned	Cash rent	Share rent
		Percent	
Southeast:			
Alabama	38.6	42.5	18.9
Georgia	56.1	37.5	6.4
South Carolina	50.5	43.8	5.7
Delta States:			
Arkansas	32.5	17.2	50.3
Louisiana	50.4	17.8	31.8
Mississippi	40.6	52.8	6.6
Missouri	28.6	8.6	62.8
Tennessee	42.3	19.9	32.8
Southern Plains:			
Oklahoma--			
Irrigated	44.6	10.9	42.9
Nonirrigated	40.0	17.3	40.6
Texas--			
Irrigated 1/	45.8	9.0	45.2
Nonirrigated 1/	29.2	8.2	62.6
West:			
Arizona	42.8	40.9	16.3
California	46.1	28.6	25.3

1/ The sum of the percentages for these items does not total 100 percent. A small percentage of "free rent" land accounts for the difference in both cases.

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Fertilizer and Lime

Fertilizer use is an important practice in all cotton producing areas. However, the pounds of active ingredients applied per acre varied markedly among the cotton producing States in 1982. 2/ The most intensive use of fertilizer occurred in the Southeast; the least intensive use occurred in Texas and Oklahoma, particularly on the nonirrigated cotton land (table 7).

Fertilizer use also differed by type of planting pattern. The most intensive use of fertilizer occurred on cotton planted in skiprow patterns in all States except Texas (app. table 1). Texas producers applied larger amounts of fertilizer per acre on cotton planted in solid patterns than on skiprow cotton.

Pesticide and Seed Inputs

Pesticide inputs constitute a major cost item in most cotton production areas. In 1982, average per acre cost of pesticides, including some custom

2/ The pounds per acre in this case as well as other rates used in the narrative and various tables refer to the rate per acre of cotton.

Table 2--Average cash rental rates and share rental arrangements in cotton production, 1982

State	Cash rental rates per acre	Landlord's share of selected expenses and product						
		Insecticide	Herbicide	Seed	Fertilizer	Harvest	Cotton lint	Cotton seed
	Dollars	Percent						
Southeast:								
Alabama	46.30	22.7	3.3	9.3	24.9	0	28.5	28.5
Georgia	37.10	50.0	30.0	40.0	50.0	0	40.0	40.0
South Carolina	33.55	8.3	0	16.7	16.7	0	25.0	16.7
Delta States:								
Arkansas	50.00	4.7	8.0	2.3	15.0	0	26.1	16.0
Louisiana	61.71	5.7	2.4	.8	6.5	0	21.9	16.8
Mississippi	51.41	7.5	5.0	0	7.5	0	24.3	5.0
Missouri	66.17	0	0	0	26.2	0	27.3	27.3
Tennessee	39.80	0	0	0	14.1	0	25.7	14.1
Southern Plains:								
Oklahoma --								
Irrigated	61.91	6.8	4.7	.8	12.7	1.2	27.1	19.7
Nonirrigated	28.58	10.1	0	2.3	18.1	0	27.2	24.6
Texas --								
Irrigated	50.71	4.7	3.6	.8	12.8	2.4	24.8	23.3
Nonirrigated	24.36	7.4	4.4	0	15.2	1.8	24.6	22.8
West:								
Arizona	120.15	40.0	42.5	42.5	42.5	20.0	48.4	48.4
California	169.04	.9	.9	.9	3.7	0	24.5	20.9

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applications, ranged from $7.35 for nonirrigated cotton in Oklahoma to $127.37 in South Carolina (table 8). Insecticide use was the main component of total chemical costs in most cases. Herbicide costs were less variable throughout the Cotton Belt than were insecticide costs because of greater regional differences in insect infestation compared with weed and grass control in cotton.

Seeding rates ranged from about 12 pounds per acre of cotton in Georgia to 24 pounds for the Texas irrigated farms (table 8).

Hired Management and Labor Inputs

Cotton farms using hired management were more prevalent in the Delta and the West than in other regions of the Cotton Belt. It was also a significant practice in Alabama and South Carolina (table 9).

Table 3--Cropland use on sample cotton farms, 1982

State	Cotton	Soybeans	Small grain 1/	Feed grain 2/	Rice	Alfalfa	Total cropland 3/	Sample farms
	Acres per farm							Number
Southeast:								
Alabama	670	329	78	48	0	0	1,315	53
Georgia	365	282	134	76	0	0	968	46
South Carolina	498	749	271	172	0	0	1,703	25
Delta States:								
Arkansas	542	830	369	4	137	0	1,714	34
Louisiana	850	663	92	7	106	0	1,791	45
Mississippi	872	840	162	10	18	0	1,955	53
Missouri	466	404	320	120	0	0	1,130	16
Tennessee	414	590	222	89	0	0	1,281	12
Southern Plains:								
Oklahoma --								
Irrigated	214	0	486	13	0	17	780	37
Nonirrigated	303	7	341	21	2	13	817	56
Texas --								
Irrigated	851	20	118	262	0	9	1,684	98
Nonirrigated	1,235	5	198	435	0	2	2,533	95
West:								
Arizona	633	0	306	17	0	103	1,399	48
California	847	0	223	32	2	134	1,646	58

1/ Barley, oats, rye, and wheat.
2/ Corn and grain sorghum.
3/ Total cropland operated in 1982, including fallowed and idle cropland. The sum of the individual crops shown for the various States does not equal total cropland because only four crops in addition to cotton were tabulated for each farm in the sample. Where total cropland acreage exceeds the sum of individual crop acres, the result is largely the effect of doublecropping.

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The use of hand labor in cotton production is a common practice on many farms. Hand labor operations--including such jobs as hoeing, weeding, and hand spraying--were generally less common in the Southeast and some Delta States than in the other cotton regions. For example, average hand labor cost for the 1982 cotton crop ranged from less than a dollar per acre in Georgia and Tennessee to $38.52 per acre in California (table 9).

In all survey States except one, at least 90 percent of the sample farms hired regular full-time workers (table 10). In addition, farm operators spent a large percentage of their time on crop production. Unpaid labor also constituted a substantial labor input on cotton farms, exceeding 100 hours per farm in all cotton States except Arizona, Arkansas, Louisiana, and Missouri. While the use of hand field labor, unpaid labor, and hired management also varies by planting pattern, the results do not show consistent differences between solid and skiprow planted cotton with respect to these labor uses (app. table 2).

Table 4--Average acreage planted to cotton on sample farms by planting pattern, 1982

State	Irrigated		Nonirrigated	
	Solid	Skiprow	Solid	Skiprow
	Acres of cotton per farm			
Southeast:				
Alabama	7	0	341	322
Georgia	41	36	268	20
South Carolina	5	9	431	53
Delta States:				
Arkansas	37	0	450	55
Louisiana	58	22	622	148
Mississippi	32	43	536	261
Missouri	0	0	450	16
Tennessee	12	0	402	0
Southern Plains:				
Oklahoma --				
Irrigated	130	0	77	7
Nonirrigated	8	0	295	0
Texas --				
Irrigated	579	55	150	67
Nonirrigated	148	9	551	527
West:				
Arizona	592	41	0	0
California	801	46	0	0

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Machinery Operations

Cotton production requires a basic set of functions or field operations regardless of location of production. These include tillage and seedbed preparation, planting, pest control, and harvest. The types of machinery and equipment used to perform these basic functions in production may vary among regions depending on differences in climate, soils, topography, and related factors. While regional differences do occur, farmers typically follow a common sequence of practices in performing the essential functions in cotton production. These include (1) residue disposal, (2) preplant tillage, (3) seedbed preparation, (4) planting, (5) postemergence weed control, (6) insect and disease control, and (7) harvesting and hauling cotton to a gin. Irrigation can be added to the sequence for the irrigated areas.

The data in table 11 show the average number of machinery operations per acre for the 1982 cotton crop. This summary identifies the most common or predominant field operations occurring in the production process. A large

Table 5--Reduced acreage program (RAP) participation on sample farms, 1982

State	Proportion of farms participating	Proportion of RAP acreage seeded to cover crop 1/	Type of cover crop			
			Small grains	Legumes	Grasses	All other
			Percent			
Southeast:						
Alabama	98.1	24.9	40.0	26.7	33.3	0
Georgia	84.8	9.8	50.0	16.7	16.7	16.7
South Carolina	96.0	5.5	50.0	50.0	0	0
Delta States:						
Arkansas	91.2	15.8	66.7	33.3	0	0
Louisiana	77.8	19.8	11.1	0	55.6	33.3
Mississippi	96.2	17.6	50.0	16.7	25.0	8.3
Missouri	93.8	20.6	50.0	5.0	0	25.0
Tennessee	91.7	28.0	25.0	75.0	0	0
Southern Plains:						
Oklahoma --						
Irrigated	91.9	36.0	50.0	18.8	6.2	25.0
Nonirrigated	82.1	37.0	47.6	19.0	9.5	23.8
Texas --						
Irrigated	92.9	37.4	57.2	4.8	35.7	2.4
Nonirrigated	96.8	37.2	31.7	7.3	43.9	17.1
West:						
Arizona	83.3	6.0	33.3	0	66.7	0
California	60.3	8.0	33.3	0	33.3	33.3

1/ The "cover crop" category includes all crops designated for conservation uses under RAP that were seeded on the diverted acreage.

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part of the variation in field operations can be attributed to regional differences in machinery use requirements for insect and weed control. Insect control tends to be a more severe problem in the Southeast than in other regions of the Cotton Belt.

Harvest operations vary by regions. Cotton producers in the West and the portion of the Cotton Belt lying east of the Rolling Plains of Texas and Oklahoma usually harvest with a spindle-type picker. Two-row, self-propelled machines predominate. Fifty to 75 percent of the crop is spindle picked a second time. Cotton producers in the Rolling Plains of Texas and Oklahoma and the High Plains of Texas use stripper harvesters. Two-row, tractor-mounted and self-propelled machines predominate. Stripping is a once-over operation.

It appears that the total number of field operations has declined slightly in most regions since 1978. This decline from 1978 to 1982 relates largely to fewer fertilizer and chemical applications in several States and also to fewer tillage operations in a number of cases (1).

Table 6--Tractor numbers, average size, and use on cotton farms, 1982

State	Tractors per farm	Average horse power	Fuel type			Tractors purchased new	Average age	Average use per year 1/
			Gasoline	Diesel	LP gas			
	----Number---		--------- Percent ----------				Years	Hours
Southeast:								
Alabama	5.2	121	1.4	98.2	0.4	80.3	7.3	497
Georgia	4.0	123	0	100.0	0	80.6	7.2	497
South Carolina	4.8	127	0	100.0	0	87.4	6.3	592
Delta States:								
Arkansas	5.3	135	.6	97.8	1.6	86.0	6.7	577
Louisiana	4.8	137	.5	98.1	1.4	83.8	6.2	521
Mississippi	7.1	143	.5	98.4	1.1	88.9	6.1	562
Missouri	3.8	130	11.7	88.3	0	75.0	8.0	691
Tennessee	4.3	128	0	100.0	0	57.7	7.4	550
Southern Plains:								
Oklahoma --								
Irrigated	2.7	115	1.0	89.9	9.1	71.6	7.2	509
Nonirrigated	2.6	118	0	87.1	12.9	62.9	8.8	533
Texas --								
Irrigated	4.5	124	.9	93.9	5.2	74.1	7.3	934
Nonirrigated	4.4	131	2.2	91.6	6.2	73.8	7.0	880
West:								
Arizona	5.2	120	4.8	94.0	1.2	65.4	7.6	935
California	4.7	126	2.6	97.0	.4	62.3	9.1	1,062

1/ Hours used for all purposes.

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The type and size of machinery and equipment, and the number of field operations influence production costs and the competitive strength of cotton in the agriculture of various regions. The increasing costs of energy and other machinery operating costs compel producers to minimize the number of field operations used in cotton production.

Custom Machine Work

Most custom machine work on cotton farms relates to the harvest operations. In 1982, for example, custom harvest costs per acre accounted for 84 percent or more of total custom machine costs in all cotton States except Arkansas and California (table 12). However, marked variation occurred among States in average cost of custom harvest, ranging from $2.46 per acre in Arkansas to $40.55 per acre in California. In addition to California, other States having relatively hign average cost per acre for custom machine harvest in 1982

Table 7--Fertilizer use and custom rates per acre, 1982

State	Active ingredients (a.i.)			Lime	Custom application rates	
	Nitrogen	Phosphorus	Potash		Fertilizer	Lime 1/
	----- Pounds (a.i.) per acre -----				------ Dollars -----	
Southeast:						
Alabama	85.6	53.5	60.9	1,160	2.79	14.47
Georgia	62.9	43.9	75.8	340	2.25	21.21
South Carolina	76.7	50.1	105.1	540	2.50	22.10
Delta States:						
Arkansas	64.4	20.3	40.7	120	2.50	14.00
Louisiana	81.2	31.0	40.3	40	3.00	23.33
Mississippi	101.8	14.7	25.1	440	2.71	21.07
Missouri	53.3	15.5	74.7	140	2/	2/
Tennessee	75.0	49.6	75.2	100	2.52	16.00
Southern Plains:						
Oklahoma --	--	--	--	--	3.89 3/	2/
Irrigated	52.2	25.3	8.0	0	--	--
Nonirrigated	13.3	12.5	3.7	0	--	--
Texas --	--	--	--	--	2.29 3/	2/
Irrigated	42.3	23.0	4.6	0	--	--
Nonirrigated	19.3	12.8	1.7	0	--	--
West:						
Arizona	117.6	26.6	2.5	0	6.83	2/
California	135.7	27.2	4.6	180 4/	6.48	2/

-- = Not reported.
1/ These rates include the cost of material and application.
2/ None reported.
3/ These estimates reflect average custom rates for the State.
4/ Gypsum.

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included Arizona ($37.36), Tennessee ($13.53), and Oklahoma ($15.32) irrigated cotton.

Cotton Handling Technology

The use of trailers to move cotton to the gin following harvest is the dominant practice in the Southeast and Delta regions. However, use of the module builder is an important practice in the West and Southern Plains, particularly in Texas where handling seed cotton between harvest and ginning is divided about equally between trailers and modules (table 13). The module equipment compresses cotton into modules that can be held temporarily on the farm or at the gin. A single module builder can handle a substantial acreage of cotton (table 13).

Table 8--Chemicals, custom application and insect scouting costs, and seeding rates, 1982

State	Cost per acre						Seeding rates
	Herbicide	Insecticide	Defoliant	Other 1/	Total pesticide	Scouting cost 2/	
	Dollars						Pounds
Southeast:							
Alabama	22.07	65.37	7.32	4.28	99.04	2.40	15.6
Georgia	23.10	83.37	9.77	3.43	119.67	2.82	11.5
South Carolina	19.58	97.90	5.01	4.88	127.37	2.21	10.8
Delta States:							
Arkansas	28.26	31.34	6.04	1.25	66.89	2.03	18.4
Louisiana	25.77	52.29	4.95	1.25	84.26	2.86	15.7
Mississippi	31.10	62.36	8.97	1.40	103.83	3.45	15.4
Missouri	15.98	3.46	4.35	0	23.79	.27	17.1
Tennessee	19.52	3.17	2.12	.55	25.36	.63	18.6
Southern Plains:							
Oklahoma --							
Irrigated	9.73	26.12	3.8	0	38.93	1.04	20.8
Nonirrigated	5.86	1.23	.26	0	7.35	.07	16.8
Texas --							
Irrigated	9.57	20.52	3.56	.31	33.96	.95	23.5
Nonirrigated	7.68	7.32	2.29	.22	17.51	.20	20.0
West:							
Arizona	13.14	64.19	11.67	3.54	94.12	2.09	15.1
California	15.49	21.41	19.10	2.52	58.52	2.66	17.3

1/ Fungicides and nematicides.
2/ Includes materials and custom application.

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Irrigation Systems

Irrigation is an important practice in the western part of the Cotton Belt. In some areas of the West, crop production is impossible without irrigation. In other areas, production is possible, but substantial yield increases are usually obtained from the use of supplemental water. This section summarizes information from the cotton cost-of-production survey about sources of water, irrigation pumps, water use, and water distribution methods.

Sources of Water

Irrigation water comes from three sources: (1) irrigation wells pumping from underground supplies, (2) water purchased from a canal or ditch company, or from irrigation districts, and (3) surface sources or water pumped from rivers, lakes, or ponds. Wells or underground water supplies constitute the

Table 9--Hired management, hand labor cost, and unpaid hand labor used per acre, 1982

State	Hired management cost per acre 1/	Farms reporting hired management	Hand field labor cost per acre 2/	Unpaid hand field labor per acre 3/
	Dollars	Percent	Dollars	Hour
Southeast:				
Alabama	2.36	17.0	2.52	0.06
Georgia	.06	2.2	.97	.55
South Carolina	4.81	24.0	2.63	.15
Delta States:				
Arkansas	3.93	26.5	10.02	.15
Louisiana	3.58	22.2	2.50	0
Mississippi	3.94	39.6	8.11	.05
Missouri	.34	6.2	5.98	.06
Tennessee	.52	16.7	.13	.03
Southern Plains:				
Oklahoma --				
Irrigated	.02	2.7	9.59	.17
Nonirrigated	.04	8.9	5.26	.35
Texas --				
Irrigated	.84	9.4	9.46	.11
Nonirrigated	.39	6.3	4.01	.18
West:				
Arizona	3.13	20.5	16.40	0
California	4.17	12.5	38.52	.14

1/ Cost per acre of all crops including cotton.
2/ This cost included paid labor expenses for hoeing, weed pulling, hand spraying, and other hand labor for the 1982 cotton crop.
3/ Unpaid labor spent on cotton.

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main source in most States (table 14). Purchased water is an important source in the West as well as in Oklahoma in the Southern Plains. Well water is the dominant source in Georgia; however, surface water is also an important source in the State.

Well Water and Surface Water Pumps

Pump characteristics vary among regions and farms, depending on the source and availability of water. For example, average pumping lift of well water

Table 10--Hired labor use and operator labor use on cotton farms, 1982

State	Farms using hired crop labor	Operator time spent on crops	Operator time on machinery operations 1/	Unpaid labor per farm 2/	Unpaid machinery labor per farm
	Percent			Hours	
Southeast:					
Alabama	88.7	81.6	25.7	414	269
Georgia	91.3	82.3	31.7	221	75
South Carolina	100.0	93.6	11.5	602	306
Delta States:					
Arkansas	100.0	96.6	17.6	86	40
Louisiana	100.0	81.3	11.4	52	9
Mississippi	98.1	90.0	13.8	345	161
Missouri	100.0	82.8	13.2	35	16
Tennessee	91.7	83.8	47.6	457	264
Southern Plains:					
Oklahoma --					
Irrigated	100.0	81.1	52.2	515	338
Nonirrigated	91.1	79.4	58.6	416	271
Texas --					
Irrigated --					
Solid	96.5	89.6	39.3	426	44
Skiprow	100.0	91.5	57.5	338	106
Nonirrigated --					
Solid	91.1	83.2	35.6	326	147
Skiprow	98.0	85.7	42.9	357	184
West:					
Arizona	97.9	88.3	12.2	58	2
California	96.5	86.1	15.3	128	31

1/ Percentage of total operator time spent on crops that was devoted to machinery operations.

2/ These items include the unpaid work performed by family, other partners--if a partnership--or any other unpaid labor, except the full-time operator, on cotton and other crops reported on sample farms.

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Table 11--Summary of field operations for cotton, 1982

State	Times over per acre for specified operations 1/							
	MB plow, chisel, subsoiler, lister	Tandem disk, offset disk, harrow, field cultivator	Spread fertilizer, chemicals	Planter	Sand fighter, cultivator (shank, rolling or rotary)	Cotton picker, stripper, gleaner	Other 2/	Total
	Number							
Southeast:								
Alabama	1.38	3.06	3.92	1.17	4.09	1.89	0.66	16.18
Georgia	.81	3.15	9.56	1.05	2.73	1.15	.58	19.03
South Carolina	1.02	4.39	8.34	1.10	2.84	1.50	.21	19.40
Delta:								
Arkansas	2.30	4.02	2.23	1.01	4.46	1.74	.45	16.21
Louisiana	2.76	4.45	1.68	1.07	3.20	1.61	.58	15.35
Mississippi	2.76	4.06	2.10	1.13	4.93	1.64	.75	17.37
Missouri	2.11	2.72	1.42	1.00	4.74	1.86	.76	14.61
Tennessee	.91	3.14	1.29	1.00	2.43	1.48	.63	10.88
Southern Plains:								
Oklahoma --								
Irrigated	3.42	2.05	1.73	1.09	6.07	.91	.88	16.15
Nonirrigated	2.18	2.33	.46	1.14	2.97	.82	.47	10.37
Texas --								
Irrigated	2.33	3.62	1.16	1.43	5.86	1.01	.76	16.38
Nonirrigated	3.12	2.92	1.00	1.46	6.98	.84	.73	17.34
West:								
Arizona	2.04	3.97	2.01	1.02	3.91	1.84	1.69	16.48
California	2.12	4.12	.54	.92	4.28	1.40	1.12	14.37

1/ Excludes custom operations.
2/ Includes landplane leveler, ditcher, shredder, border disk, corrugator, and float.

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(distance from water level in the well to the pump discharge level) ranged from 29 feet in Mississippi to 395 feet in Arizona (table 14). Similar marked variation occurs in pump discharge rates. In 1982, average pumping rates for well water ranged from about 400 gallons per minute in Texas to over 1,800 gallons per minute in Mississippi (table 14). Pumping rates and average lift also varied markedly from region to region by type of power unit (table 15).

A relatively small lift and high pumping rates characterize most irrigation units pumping water from surface sources. The purchase of irrigation water is an important practice in irrigated areas of the West where average per acre cost of water purchased in 1982 amounted to $55 in Arizona and $51 in California (table 16). Significant amounts of the irrigation water also come from purchased sources in the Southern Plains region, particularly Oklahoma. Average cost per acre of irrigation water in this region from purchased sources ranged from about $18 in Texas to slightly over $20 in Oklahoma (table 16).

Table 12--Average costs of custom machine input

State	Custom machine costs 1/		
	Preharvest	Harvest	Total
	Dollars per acre		
Southeast:			
Alabama	0.21	3.19	3.40
Georgia	1.02	7.42	8.44
South Carolina	0	5.68	5.68
Delta States:			
Arkansas	3.53	2.46	5.99
Louisiana	0	6.34	6.34
Mississippi	.07	5.71	5.78
Missouri	0	6.27	6.27
Tennessee	0	13.53	13.53
Southern Plains:			
Oklahoma --			
Irrigated	.08	15.32	15.40
Nonirrigated	.35	4.84	5.19
Texas --			
Irrigated	1.75	9.01	10.76
Nonirrigated	0	4.82	4.82
West:			
Arizona	2.77	37.36	40.13
California	11.50	40.55	52.05

1/ Excludes custom application of chemicals and fertilizers.

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Power Units

Pumping lift, pumping rates, and annual use significantly affect power cost (fuel) in irrigation. Since these factors vary markedly from one area to another, the cost of operating power units also varies widely among States. For example, average power cost in 1982 ranged from about $5 per acre of irrigated cotton in Mississippi to $79 per acre in Arizona (table 17). Diesel power units were most common on irrigated cotton in the Southeast and Delta States. In contrast, the use of electric power units was the most common practice in the West and Southern Plains regions.

Table 13--Cotton handling technology, 1982

State	Distance to gin	Farms reporting		Capacity of trailer	Trailers owned per farm	Module rental per bale	Acres per module builder
		Trailers	Modules				
	Miles	--- Percent ---		Bales	Number	Dollars	Acres
Southeast:							
Alabama	6.8	82.7	17.3	5.5	12.2	0	924
Georgia	12.8	89.3	10.7	6.8	5.4	0	611
South Carolina	9.6	100.0	0	5.6	10.2	0	0
Delta States:							
Arkansas	6.6	98.9	1.1	6.1	12.3	0	162
Louisiana	9.3	89.2	10.8	7.4	15.0	0	238
Mississippi	7.4	88.9	11.1	7.0	15.3	0	391
Missouri	5.3	100.0	0	6.4	15.8	0	0
Tennessee	6.2	100.0	0	5.3	9.4	0	0
Southern Plains:							
Oklahoma --							
Irrigated	5.6	65.6	34.4	5.0	10.5	7.0	432
Dryland	8.7	82.8	17.2	4.5	8.0	0	743
Texas --							
Irrigated	8.6	50.1	49.9	5.6	11.4	3.0	844
Dryland	9.8	49.1	50.9	4.4	12.1	4.3	1,063
West:							
Arizona	7.9	55.4	44.6	5.8	10.7	11.9	686
California	9.2	67.9	32.1	7.5	16.4	27.0	612

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Water Application Systems

Sprinkler irrigation is the dominant method of irrigating cotton in the Southeast; gravity application dominates in the West. 3/ Both sprinkler and gravity methods are common in the Southern Plains and Delta States. Center pivot and big gun are the most common sprinkler systems. Both systems handle acreages of comparable size, averaging between 200 and 300 acres per unit in most cases (table 18).

Gated pipe and siphon tubes constitute the most common applications in gravity irrigation. In 1982, siphon tubes accounted for about 78 percent of the irrigated cotton acreage in Arizona, 49 percent in Oklahoma, 41 percent in California, and 33 percent in Texas (table 19).

PRODUCTION COSTS

Cash expenses of producing U.S. cotton averaged 61.8 cents per pound in 1983, compared with 53.1 cents per pound in 1981 (table 20). These expenses reflect harvested yields, and shortrun, out-of-pocket variable and fixed costs incurred on an average acre of cotton. Variable cash expenses are incurred only if production takes place. They include such input items as seed, fertilizer, chemicals, custom operations, fuel, repairs, irrigation, ginning, and management fees. In contrast, fixed cash expenses are incurred whether or not production occurs. These expenses include such items as taxes, overhead, insurance, interest, and rent.

Cash expenses with replacement include total cash expenses plus an allowance for the replacement of machinery and equipment used in the production process. In 1983, for example, the replacement allowance added about 10 cents per pound to cash expenses for U.S. production.

Economic costs include all cash expenses (less cash interest), capital replacement, and allocated returns to operating capital, nonland capital, land rent, and labor. The allocated returns for some items were imputed because they cannot be measured directly. 4/ The estimates in table 20 show economic costs both excluding and including land. Economic cost including land indicates the breakeven price required in the longer run to continue producing a crop. Total economic costs of producing U.S. cotton, including land, ranged from 69.9 cents per pound in 1981 to 83.9 cents in 1983. These costs averaged well above cash receipts or the harvest period average price per pound (table 20). In fact, the average price received each year in most cases covered little more than total cash expenses.

3/ Sprinkler irrigation involves pumping water through a sprinkler system under pressure; gravity irrigation involves the flooding of a field or running water down furrows by gravity. In the latter case, water is typically delivered to the field from the pump through pipe or a head ditch. The water is released onto the field through gated pipe or through siphon tubes from the head ditch.

4/ For a discussion of methods for estimating costs of production, see (2).

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Table 14--Percentage of cotton irrigated on farms surveyed, sources of water, and pumping from wells, 1982

State	Cotton acreage irrigated 1/	Sources of water			Pumping from wells				
		Wells	Purchased 2/	Surface 3/	Irrigated per well	Depth of well	Pumping lift	Pumping rate	Total power units in sample
	Percent				Acres	Feet		GPM 4/	Number
Southeast:									
Georgia	20.4	78.3	0	21.7	225	337	160	1,211	18
Delta States:									
Louisiana	8.1	81.8	0	18.2	204	93	32	1,315	26
Mississippi	11.5	83.1	4.6	12.3	160	120	29	1,810	46
Southern Plains:									
Oklahoma --									
Irrigated	100.0	52.5	46.3	1.2	75	133	68	446	81
Texas --									
Irrigated	100.0	80.6	14.8	4.6	90	210	176	398	952
West:									
Arizona	100.0	53.3	44.8	1.9	148	883	395	1,280	232
California	100.0	30.3	69.7	0	110	436	204	1,499	249

1/ Percentage of cotton acreage on sample farms that was irrigated in 1982.
2/ Purchased from canal or ditch company or from an irrigation company.
3/ Pumped from rivers, lakes, or ponds.
4/ Gallons per minute.

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Substantial regional differences occur from year to year in cotton production costs. In 1983, for example, cash costs per pound ranged from 56.4 cents in the Southern Plains to 86.2 cents in the Southeast. Differences in cost of individual inputs as well as yields largely account for the wide variation in per unit costs of production (app. tables 3-7).

Significant cost differences also occurred among cotton producing States and between irrigated and nonirrigated cotton production in the Southwest and West. For example, cash expenses per pound of lint in 1982 ranged from 40 cents in Missouri to 65 cents for irrigated cotton in Texas (table 21). The differences in unit costs relate largely to variation in the mix and level of inputs and the resulting yields. For example, fertilizer and chemical inputs are major components of cash expenses in the Southeast; chemical inputs and irrigation are major cost items in the West.

Table 15--Average size and use of irrigation power units and pumping rates on sample farms by type of power unit, 1982

Item	Gasoline	LP gas	Diesel	Electric	Natural gas	Tractor	Average
Southeast:							
Units (number)	2/	5	21	10	2/	3/	--
Ave. size (cu. in./hp) 1/		224	565	121			--
Ave. pumping rate (GPM) 4/		920	900	1,190			969
Ave. annual use (hours)		178	256	543			316
Delta States:							
Units (number)	2/	14	52	17	2/	5	--
Ave. size (cu. in./hp) 1/		211	299	30		100	--
Ave. pumping rate (GPM) 4/		1,364	1,697	1,394		2,200	1,614
Ave. annual use (hours)		316	408	273		280	360
Southern Plains:							
Units (number)	3/	113	31	651	289	12	--
Ave. size (cu. in./hp) 1/		273	265	42	333	114	--
Ave. pumping rate (GPM) 4/		988	2,143	3174	492	2,546	508
Ave. annual use (hours)		516	880	1,611	1,298	700	1,384
West:							
Units (number)	2/	7	20	523	64	7	--
Ave. size (cu. in./hp) 1/		466	285	100	283	96	--
Ave. pumping rate (GPM) 4/		2,214	1,925	1,318	1,495	1,687	1,371
Ave. annual use (hours)		1,357	2,342	928	1,739	1,217	1,065

-- = Not applicable.

1/ Size of electric motors and tractors were reported in horsepower units.

2/ No observations in sample.

3/ Since the sample included fewer than five observations, the data are not reported to avoid possible disclosure of an individual farm operation.

4/ Gallons per minute.

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Table 16--Irrigation from surface sources and purchased water cost, 1982

State	Surface sources						Purchased water cost per acre 2/
	Pipe per acre irrigated	Average lift	Pumps per farm	Irrigated per pump 1/	Pumping rate	Total power units in sample	
	--- Feet ---		Number	Acres	GPM 3/	Number	Dollars
Southeast:							
Alabama	10.7	18.3	2.0	118	1,350	4	4/
Georgia	20.3	18.2	1.0	313	920	10	4/
Delta States:							
Louisiana	14.5	19.5	1.5	391	1,378	9	4/
Mississippi	3.8	14.3	1.0	65	1,467	6	14.00
Southern Plains:							
Oklahoma --							
Irrigated	5/						20.34
Texas --							
Irrigated	7.3	27.6	3.6	875	2,468	50	17.50
West:							
Arizona	5/						54.67
California	5/						50.85

1/ Acres of all crops.
2/ Total cost of water per acre of cotton irrigated with purchased water.
3/ Gallons per minute.
4/ None reported.
5/ Data not reported to avoid possible disclosure of individual farm operation.

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Variable inputs accounted for 50 percent or more of total economic costs in 1982 for all cotton States except Missouri and the nonirrigated cotton in Oklahoma (app. tables 8-21). Relatively low levels of fertilizer and chemical inputs largely accounted for the two exceptions. Capital replacement and land rent both constituted major items in total economic costs.

Table 17--Types of power units used to pump irrigation water and power cost per acre in cotton production, 1982

State	Power units by type 1/						Total units in sample	Power cost per acre 2/
	Gasoline	LP gas	Diesel	Electric	Natural gas	Tractor		
	Percent						Number	Dollars
Southeast:								
Alabama	0	0	100.0	0	0	0	4	19.86
Georgia	0	7.1	60.7	32.2	0	0	28	12.43
South Carolina	0	60.0	0	20.0	0	20.0	5	19.94
Delta States:								
Louisiana	0	14.3	48.6	34.3	0	2.8	35	10.54
Mississippi	0	17.3	65.4	9.6	0	7.7	52	4.96
Southern Plains:								
Oklahoma	0	2.4	0	66.3	28.9	2.4	83	28.14
Texas	.1	10.9	3.1	58.8	26.1	1.0	1,014	17.54
West:								
Arizona	0	2.9	0	79.6	17.5	0	240	79.00
California	0	0	0	87.1	5.8	1.8	381	28.57

1/ Includes pumping from both well and surface sources.
2/ Power cost per acre of cotton irrigated.

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Table 18--Irrigation water distribution methods, 1982

State	Covered per unit 1/		Frequency of head ditch construction each year	Average field size	Type of ditch		
	Center pivot	Big gun			Cement	Dirt	Both
	---- Acres ----		Number	Acres	---- Percent ----		
Southeast:							
Alabama	240	286					
Georgia	286	174					
South Carolina	293	20					
Delta States:							
Arkansas	0	0					
Louisiana	203	330	1.0	11.1	0	100.0	0
Mississippi	253	0	2.0	29.2	0	100.0	0
Missouri	0	0					
Tennessee	75	0					
Southern Plains:							
Oklahoma --							
Irrigated	220	0	1.3	59.0	48.5	10.9	40.6
Texas --							
Irrigated	178	0	1.4	65.6	84.0	2.0	14.0
West:							
Arizona	0	0					
California	0	0	3.3	84.1	22.5	57.5	20.0

1/ Acres of all crops covered per unit.

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Table 19--Irrigation application systems, 1982

State	Farms reporting	Cotton acreage irrigated by system	Applications of water on cotton	Water applied per application	Total water applied per acre	Total acres irrigated per unit 1/
	Number	Percent	Number	-- Acre inches --		Acres
Southeast:						
Georgia --						
Center pivot	10	86.4	--	--	4.8	286
Delta States:						
Louisiana --						
Center pivot	6	38.5	--	--	4.1	203
Gated pipe	6	49.3	4.2	2.1	8.8	NA
Mississippi --						
Center pivot	7	43.6	--	--	4.9	253
Gated pipe	7	39.7	1.6	2.4	4.0	NA
Southern Plains:						
Oklahoma --						
Side roll	7	12.0	2.3	2.7	7.3	NA
Center pivot	5	13.6	--	--	12.5	220
Gated pipe	15	20.3	3.6	3.8	13.4	NA
Siphon tubes	12	48.9	3.4	3.7	12.4	NA
Texas --						
Side roll	15	7.6	1.7	2.7	4.5	NA
Center pivot	22	19.1	--	--	6.6	NA
Gated pipe	52	32.9	2.2	4.9	9.9	NA
Siphon tubes	48	33.3	2.4	4.8	11.2	NA
Flood	8	6.1	2.4	5.2	13.0	NA
West:						
Arizona --						
Siphon tube	39	77.9	8.2	6.7	54.5	NA
Flood	10	14.9	6.9	5.4	36.9	NA
California --						
Hand moved	9	12.6	4.1	7.8	32.3	MA
Gated pipe	21	28.6	5.6	5.9	32.3	NA
Siphon tube	30	41.4	5.3	6.8	35.0	NA
Flood	13	17.2	5.8	6.9	40.4	NA

-- = Not reported.
NA = Not applicable.
1/ Total acres of all crops irrigated per unit, including cotton.

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Table 20--U.S. and regional cotton production costs and receipts per pound, 1981-83.

Region	1981	1982	1983	Average 1981-83
	Dollars per pound			
United States:				
Cash expense	0.531	0.545	0.618	0.565
Cash expense with replacement 1/	.604	.621	.714	.646
Economic costs excluding land 2/	.603	.618	.706	.642
Economic costs including land	.699	.719	.839	.752
Cash receipts-lint	.547	.580	.664	.597
Cash receipts-seed	.074	.064	.140	.093
Delta States:				
Cash expenses	.536	.470	.615	.540
Cash expenses with replacement	.623	.540	.715	.626
Economic costs excluding land	.627	.506	.660	.598
Economic costs including land	.733	.594	.770	.699
Cash receipts-lint	.563	.582	.664	.603
Cash receipts-seed	.066	.050	.133	.080
Southeast:				
Cash expenses	.600	.504	.862	.655
Cash expenses with replacement	.689	.574	.995	.753
Economic costs excluding land	.682	.544	.931	.719
Economic costs including land	.770	.616	1.050	.812
Cash receipts-lint	.570	.579	.674	.608
Cash receipts-seed	.066	.047	.129	.081
Southern Plains:				
Cash expenses	.497	.570	.564	.544
Cash expenses with replacement	.577	.680	.680	.646
Economic costs excluding land	.600	.750	.744	.698
Economic costs including land	.694	.846	.878	.806
Cash receipts-lint	.480	.514	.600	.531
Cash receipts-seed	.080	.070	.144	.101
West:				
Cash expenses	.558	.601	.638	.599
Cash expenses with replacement	.611	.660	.704	.658
Economic costs excluding land	.576	.638	.672	.629
Economic costs including land	.671	.760	.821	.751
Cash receipts-lint	.614	.625	.722	.654
Cash receipts-seed	.074	.075	.143	.097

1/ Cash expenses plus an allowance for the replacement of machinery and equipment.

2/ The major differences between cash expenses and economic costs measurements relate to the way interest on capital investment is handled and the inclusion of labor costs. Cash expenses include all interest payments on real estate and nonland categories, while economic costs do not include cash interest payments. Economic costs include an imputed long-term average rate of return on production assets and an opportunity cost of annual operating capital based on the 6-month U.S. Treasury bill rate.

Source: (2).

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Table 21--Cotton production costs, United States and selected States, 1982

State	Cash expenses	Cash expenses with replacement 1/	Economic costs excluding land 1/	Economic costs including land
		Dollars per pound		
Southeast:				
Alabama	0.478	0.550	0.520	0.604
Georgia	.544	.622	.603	.656
South Carolina	.535	.602	.570	.619
Delta States:				
Arkansas	.475	.553	.540	.651
Louisiana	.486	.560	.526	.627
Mississippi	.471	.536	.498	.569
Missouri	.401	.479	.452	.583
Tennessee	.452	.526	.471	.560
Southern Plains:				
Oklahoma --				
Irrigated	.530	.627	.676	.767
Nonirrigated	.479	.573	.649	.758
Texas --				
Irrigated	.652	.787	.882	.954
Nonirrigated	.537	.636	.698	.807
West:				
Arizona	.640	.723	.706	.803
California	.603	.654	.628	.761
United States	.545	.621	.618	.719

1/ See table 20 footnotes.

Source: (3).

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2. U.S. Department of Agriculture, Economic Research Service. Economic Indicators of the Farm Sector: Costs of Production, 1983. ECIFS 3-1. July 1984.

3. Unpublished computer run. Economic Research Service, Aug. 1984.

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Appendix table 1--Fertilizer use on cotton by type of planting pattern, 1982

State	Solid planted			Skiprow planted		
	Nitrogen	Phosphorus	Potash	Nitrogen	Phosphorus	Potash
	Pounds (a.i.) per acre of cotton					
Alabama	79	4o	55	96	64	69
Louisiana	64	26	36	143	48	55
Mississippi	94	17	24	113	12	27
Texas:						
Irrigated	47	24	5	11	14	5
Nonirrigated	24	16	2	15	10	2

Appendix table 2--Hand field work and hired management costs by type of planting pattern for selected States, 1982

Item					Texas	
		Alabama	Louisiana	Mississippi	Irrig.	Nonirrig.
Solid-row planted:						
Hand field work per acre	(dol.)	2.49	2.10	7.57	10.00	3.80
Unpaid labor per acre	(hours)	.06	0	.09	.12	.16
Hired magt. cost/acre	(dol.)	.32	3.40	4.15	0.84	6.19
Farms with hired magt.	(pct)	5.9	23.5	38.7	9.4	4.4
Skiprow planted:						
Hand field work per acre	(dol.)	2.55	3.92	8.91	5.75	4.19
Unpaid labor per acre	(hours)	.06	0	0	.04	.21
Hired magt. cost/acre	(dol.)	5.31	4.20	3.62	0	0.49
Farms with hired magt.	(pct)	36.8	18.2	40.9	0	8.0

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Appendix table 3--U.S. cotton production costs, 1981-83 1/ 2/

Item	1981	1982	1983
	Dollars per planted acre		
Cash receipts:			
Primary crop	286.69	319.37	308.95
Secondary crop	38.86	35.17	65.14
Total	325.55	354.54	374.09
Cash expenses:			
Seed	8.30	8.53	8.34
Fertilizer	21.66	23.28	19.09
Lime and gypsum	.96	1.14	1.10
Chemicals	42.27	47.67	48.77
Custom operations	14.26	15.75	15.69
Fuel and lubrication	35.19	35.93	32.53
Repairs	17.37	18.95	19.98
Purchased irrigation water	5.41	6.48	6.27
Ginning	46.87	49.88	44.37
Miscellaneous	1.13	1.37	1.28
Management fees	1.24	1.44	1.31
Total, variable expenses	194.66	210.42	198.73
General farm overhead	20.89	23.74	23.12
Taxes and insurance	9.95	9.40	9.78
Interest	52.91	56.47	56.23
Total, fixed expenses	83.75	89.61	89.13
Total, cash expenses	278.41	300.03	287.86
Receipts less cash expenses	47.14	54.51	86.23
Capital replacement	38.21	42.22	44.34
Receipts less cash expenses and replacement	8.93	1.29	41.89
Economic costs:			
Variable expenses	194.66	210.42	198.73
General farm overhead	20.89	23.74	23.12
Taxes and insurance	9.95	9.40	9.78
Capital replacement	38.21	42.22	44.34
Allocated returns to owned inputs:			
Return to operating capital	8.83	7.79	5.86
Return to other nonland capital	12.75	14.03	14.61
Net land rent	50.55	55.87	61.57
Labor (paid and unpaid) 3/	30.41	32.83	32.38
Total, economic costs	366.25	396.30	390.39
Residual returns to management and risk	-40.70	-41.76	-16.30
Net returns to owned inputs	61.84	68.76	98.12
		Unit	
Harvest period price (dollars/lb.)	.55	.58	.66
Yield (lbs./planted acre)	523.88	550.99	465.48

1/ To estimate the total expense or cost of production from these items, see "Using Cost of Production Data" in (2). 2/ Includes operator and landlord expenses or costs. 3/ Hired labor (a cash expense) and unpaid labor could not be separately identified given available survey data.

Source: (2).

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Appendix table 4--Cotton production costs, Southeast, 1981-83 1/ 2/

Item	1981	1982	1983
	Dollars per planted acre		
Cash receipts:			
Primary crop	301.61	427.81	272.50
Secondary crop	34.95	35.27	52.01
Total	336.56	463.08	324.51
Cash expenses:			
Seed	5.46	5.26	5.56
Fertilizer	41.68	42.69	40.73
Lime and gypsum	6.60	6.72	6.82
Chemicals	94.31	101.31	105.12
Custom operations	10.72	11.30	11.79
Fuel and lubrication	25.94	25.19	21.22
Repairs	16.55	18.54	18.91
Ginning	39.56	60.06	34.12
Miscellaneous	2.70	2.73	2.72
Management fees	1.94	1.87	1.83
Total, variable expenses	245.46	275.67	248.82
General farm overhead	12.46	17.24	17.65
Taxes and insurance	8.29	8.88	9.32
Interest	51.25	71.12	72.71
Total, fixed expenses	72.00	97.24	99.68
Total, cash expenses	317.46	372.91	348.50
Receipts less cash expenses	19.10	90.17	-23.99
Capital replacement	46.98	51.84	53.63
Receipts less cash expenses and replacement	-27.88	38.33	-77.62
Economic costs:			
Variable expenses	245.46	275.67	248.82
General farm overhead	12.46	17.24	17.65
Taxes and insurance	8.29	8.88	9.32
Capital replacement	46.98	51.84	53.63
Allocated returns to owned inputs:			
Return to operating capital	10.56	8.83	6.95
Return to other nonland capital	15.69	17.45	17.76
Net land rent	46.21	53.47	47.29
Labor (paid and unpaid) 3/	21.40	22.28	22.02
Total, economic costs	407.05	455.66	423.44
Residual returns to management and risk	-70.49	7.42	-98.93
Net returns to owned inputs	23.37	109.45	-4.91
		Unit	
Harvest period price (dollars/lb.)	.57	.58	.67
Yield (lbs./planted acre)	528.69	739.39	404.09

1/ To estimate the total expenses or cost of production from these items, see "Using Cost of Production Data" in (2). 2/ Includes operator and land lord expenses or costs. 3/ Hired labor (a cash expense) and unpaid labor could not be separately identified given available survey data.
Source: (2).

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Appendix table 5--Cotton production costs, Delta, 1981-83 1/ 2/

Item	1981	1982	1983
	Dollars per planted acre		
Cash receipts:			
Primary crop	295.46	426.17	356.82
Secondary crop	34.50	36.70	71.28
Total	329.96	462.87	428.10
Cash expenses:			
Seed	6.16	6.20	6.30
Fertilizer	31.36	31.22	30.24
Lime and gypsum	1.71	1.85	1.85
Chemicals	71.81	78.42	80.56
Custom operations	8.72	9.37	9.73
Fuel and lubrication	28.70	28.39	22.98
Repairs	18.05	20.56	21.30
Ginning	37.05	55.09	41.61
Miscellaneous	2.59	2.91	2.83
Management fees	2.45	2.59	2.46
Total, variable expenses	208.60	236.60	219.86
General farm overhead	18.83	22.87	23.10
Taxes and insurance	7.91	8.58	9.05
Interest	45.68	76.02	78.50
Total, fixed expenses	72.42	107.47	110.65
Total, cash expenses	281.02	344.07	330.51
Receipts less cash expenses	48.94	118.80	97.59
Capital replacement	45.66	51.65	53.50
Receipts less cash expenses and replacement	3.28	67.15	44.09
Economic costs:			
Variable expenses	208.60	236.60	219.86
General farm overhead	18.83	22.87	23.10
Taxes and insurance	7.91	8.58	9.05
Capital replacement	45.66	51.65	53.50
Allocated returns to owned inputs:			
Return to operating capital	8.65	7.30	5.66
Return to other nonland capital	14.72	16.75	17.10
Net land rent	55.55	64.95	59.08
Labor (paid and unpaid) 3/	24.60	26.53	26.68
Total, economic costs	384.52	435.23	414.03
Residual returns to management and risk	-54.56	27.64	14.07
Net returns to owned inputs	48.96	143.17	122.59
		Unit	
Harvest period price (dollars/lb.)	.56	.58	.66
Yield (lbs./planted acre)	524.32	732.53	537.41

1/ To estimate the total expense or cost of production from these items, see "Using Cost of Production Data" in (2). 2/ Includes operator and landlord expenses or costs. 3/ Hired labor (a cash expense) and unpaid labor could not be separately identified given available survey data.

Source: (2).

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Appendix table 6--Cotton production costs, Southern Plains, 1981-83 1/ 2/

Item	1981	1982	1983
	Dollars per planted acre		
Cash receipts:			
Primary crop	174.06	137.64	170.57
Secondary crop	29.09	18.63	41.04
Total	203.15	156.27	211.61
Cash expenses:			
Seed	9.59	10.23	9.23
Fertilizer	11.80	10.20	8.41
Chemicals	20.80	21.20	23.78
Custom operations	7.29	6.51	7.42
Fuel and lubrication	28.03	26.56	26.25
Repairs	14.54	14.69	16.40
Purchased irrigation water	1.17	1.01	1.30
Ginning	35.37	27.24	29.77
Miscellaneous	.15	.16	.14
Total, variable expenses	128.74	117.80	122.70
General farm overhead	13.20	8.59	8.99
Taxes and insurance	6.31	5.41	6.31
Interest	32.00	20.75	22.13
Total, fixed expenses	51.51	34.75	37.43
Total, cash expenses	180.25	152.55	160.13
Receipts less cash expenses	22.90	3.72	51.48
Capital replacement	28.93	29.36	32.94
Receipts less cash expenses and replacement	-6.03	-25.64	18.54
Economic costs:			
Variable expenses	128.74	117.80	122.70
General farm overhead	13.20	8.59	8.99
Taxes and insurance	6.31	5.41	6.31
Capital replacement	28.93	29.36	32.94
Allocated returns to owned inputs:			
Return to operating capital	5.98	4.85	3.83
Return to other nonland capital	9.94	10.02	11.18
Net land rent	33.92	25.75	38.06
Labor (paid and unpaid) 3/	24.53	24.76	25.24
Total, economic costs	251.55	226.54	249.25
Residual returns to management and risk	-48.40	-70.27	-37.64
Net returns to owned inputs	25.97	-4.89	40.67
		Unit	
Harvest period price (dollars/lb.)	.48	.51	.60
Yield (lbs./planted acre)	362.39	267.63	284.04

1/ To estimate the total expense or cost of production from these items, see "Using Cost of Production Data" in (2). 2/ Includes operator and landlord expenses or costs. 3/ Hired labor (a cash expense) and unpaid labor could not be separately identified given available survey data.

Source: (2).

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Appendix table 7--Cotton production costs, West, 1981-83 1/ 2/

Item	1981	1982	1983
	Dollars per planted acre		
Cash receipts:			
Primary crop	697.48	672.91	725.55
Secondary crop	83.63	81.09	143.15
Total	781.11	754.00	868.70
Cash expenses:			
Seed	7.45	7.68	9.14
Fertilizer	38.36	44.66	32.39
Lime and gypsum	1.59	1.69	1.79
Chemicals	63.53	67.26	69.76
Custom operations	49.92	52.24	53.20
Fuel and lubrication	74.94	76.30	70.90
Repairs	27.42	29.36	30.68
Purchased irrigation water	31.18	32.78	33.93
Ginning	107.19	105.43	101.28
Miscellaneous	2.21	2.41	2.49
Management fees	4.00	4.00	4.01
Total, variable expenses	407.79	423.81	409.57
General farm overhead	56.02	70.89	73.00
Taxes and insurance	27.32	22.18	22.70
Interest	143.35	130.00	134.90
Total, fixed expenses	226.69	223.07	230.60
Total, cash expenses	634.48	646.88	640.17
Receipts less cash expenses	146.63	107.12	228.53
Capital replacement	59.81	64.17	67.10
Receipts less cash expenses and replacement	86.82	42.95	161.43
Economic costs:			
Variable expenses	407.79	423.81	409.57
General farm overhead	56.02	70.89	73.00
Taxes and insurance	27.32	22.18	22.70
Capital replacement	59.81	64.17	67.10
Allocated returns to owned inputs:			
Return to operating capital	19.31	16.60	12.63
Return to other nonland capital	19.60	20.99	21.73
Net land rent	108.21	132.21	149.73
Labor (paid and unpaid) 3/	64.23	67.76	68.04
Total, economic costs	762.29	818.61	824.50
Residual returns to management and risk	18.82	-64.61	44.20
Net returns to owned inputs	230.17	172.95	296.33
		Unit	
Harvest period price (dollars/lb.)	.61	.63	.72
Yield (lbs./planted acre)	1,136.00	1,076.54	1,004.13

1/ To estimate the total expense or cost of production from these items, see "Using Cost of Production Data" in (2). 2/ Includes operator and landlord expenses or costs. 3/ Hired labor (a cash expense) and unpaid labor could not be separately identified given available survey data.

Source: (2).

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Appendix table 8--Cotton production costs, Alabama, 1982 1/

Item	1982
	Dollars per planted acre
Cash receipts:	
Primary crop	445.42
Secondary crop	36.79
Total	482.21
Cash expenses:	
Seed	5.80
Fertilizer	45.87
Lime and gypsum	9.05
Chemicals	98.15
Custom operations	8.04
Fuel and lubrication	26.29
Repairs	18.70
Ginning	53.98
Miscellaneous	2.55
Management fees	2.36
Total, variable expenses	270.79
General farm overhead	17.27
Taxes and insurance	7.63
Interest	72.10
Total, fixed expenses	97.00
Total, cash expenses	367.79
Receipts less cash expenses	114.42
Capital replacement	55.01
Receipts less cash expenses and replacement	59.41
Economic costs:	
Variable expenses	270.79
General farm overhead	17.27
Taxes and insurance	7.63
Capital replacement	55.01
Allocated returns to owned inputs:	
Return to operating capital	8.99
Return to other nonland capital	17.95
Net land rent	64.46
Labor (paid and unpaid) 2/	22.66
Total, economic costs	464.76
Residual returns to management and risk	17.45
Net returns to owned inputs	131.51
	Unit
Harvest period price (dollars/lb.)	.58
Yield (lbs./planted acre)	769.3

1/ Includes operator and landlord expenses or costs. 2/ Hired labor (a cash expense) and unpaid labor could not be separately identified given available survey data.

Source: (3).

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Appendix table 9--Cotton production costs, Georgia, 1982 1/

Item	1982
	Dollars per planted acre
Cash receipts:	
Primary crop	379.91
Secondary crop	34.42
Total	414.33
Cash expenses:	
Seed	5.61
Fertilizer	36.68
Lime and gypsum	4.15
Chemicals	118.72
Custom operations	11.66
Fuel and lubrication	25.49
Repairs	19.61
Ginning	64.15
Miscellaneous	3.11
Management fees	.06
Total, variable expenses	289.24
General farm overhead	14.83
Taxes and insurance	10.52
Interest	61.94
Total, fixed expenses	87.29
Total, cash expenses	376.53
Receipts less cash expenses	37.80
Capital replacement	53.54
Receipts less cash expenses and replacement	-15.74
Economic costs:	
Variable expenses	289.24
General farm overhead	14.83
Taxes and insurance	10.52
Capital replacement	53.54
Allocated returns to owned inputs:	
Return to operating capital	8.88
Return to other nonland capital	18.69
Net land rent	36.79
Labor (paid and unpaid) 2/	21.44
Total, economic costs	453.93
Residual returns to management and risk	-39.60
Net returns to owned inputs	46.20
	Unit
Harvest period price (dollars/lb.)	.55
Yield (lbs./planted acre)	692.00

1/ Includes operator and landlord expenses or costs. 2/ Hired labor (a cash expense) and unpaid labor could not be separately identified given available survey data.

Source: (3).

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Appendix table 10--Cotton production costs, South Carolina, 1982 1/

Item	1982
	Dollars per planted acre
Cash receipts:	
Primary crop	456.36
Secondary crop	37.67
Total	494.03
Cash expenses:	
Seed	3.64
Fertilizer	47.20
Lime and gypsum	6.59
Chemicals	126.50
Custom operations	8.66
Fuel and lubrication	23.71
Repairs	17.54
Ginning	68.34
Miscellaneous	2.80
Management fees	4.81
Total, variable expenses	309.79
General farm overhead	17.69
Taxes and insurance	9.29
Interest	73.87
Total, fixed expenses	100.85
Total, cash expenses	410.64
Receipts less cash expenses	83.39
Capital replacement	50.86
Receipts less cash expenses and replacement	32.53
Economic costs:	
Variable expenses	309.79
General farm overhead	17.69
Taxes and insurance	9.29
Capital replacement	50.86
Allocated returns to owned inputs:	
Return to operating capital	9.86
Return to other nonland capital	16.81
Net land rent	37.99
Labor (paid and unpaid) 2/	22.61
Total, economic costs	474.90
Residual returns to management and risk	19.13
Net returns to owned inputs	106.40
	Unit
Harvest period price (dollars/lb.)	.59
Yield (lbs./planted acre)	767.00

1/ Includes operator and landlord expenses or costs. 2/ Hired labor (a cash expense) and unpaid labor could not be separately identified given available survey data.

Source: (3).

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Appendix table 11--Cotton production costs, Arkansas, 1982 1/

Item	1982
	Dollars per planted acre
Cash receipts:	
Primary crop	362.62
Secondary crop	31.22
Total	393.84
Cash expenses:	
Seed	6.31
Fertilizer	27.08
Lime and gypsum	1.10
Chemicals	67.60
Custom operations	8.05
Fuel and lubrication	24.50
Repairs	19.25
Ginning	49.00
Miscellaneous	2.19
Total, variable expenses	205.08
General farm overhead	19.57
Taxes and insurance	8.33
Interest	64.10
Total, fixed expenses	92.00
Total, cash expenses	297.08
Receipts less cash expenses	96.76
Capital replacement	48.47
Receipts less cash expenses and replacement	48.29
Economic costs:	
Variable expenses	205.08
General farm overhead	19.57
Taxes and insurance	8.33
Capital replacement	48.47
Allocated returns to owned inputs:	
Return to operating capital	6.24
Return to other nonland capital	15.49
Net land rent	69.72
Labor (paid and unpaid) 2/	34.12
Total, economic costs	407.02
Residual returns to management and risk	-13.18
Net returns to owned inputs	112.39
	Unit
Harvest period price (dollars/lb.)	.58
Yield (lbs./planted acre)	625.20

1/ Includes operator and landlord expenses or costs. 2/ Hired labor (a cash expense) and unpaid labor could not be separately identified given available survey data.

Source: (3).

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Appendix table 12--Cotton production costs, Louisiana, 1982 1/

Item	1982
	Dollars per planted acre
Cash receipts:	
Primary crop	395.48
Secondary crop	34.59
Total	430.07
Cash expenses:	
Seed	6.83
Fertilizer	33.75
Lime and gypsum	.47
Chemicals	82.13
Custom operations	11.19
Fuel and lubrication	24.94
Repairs	19.76
Ginning	50.78
Miscellaneous	3.27
Management fees	3.58
Total, variable expenses	236.70
General farm overhead	21.37
Taxes and insurance	7.51
Interest	70.00
Total, fixed expenses	98.88
Total, cash expenses	335.58
Receipts less cash expenses	94.49
Capital replacement	50.98
Receipts less cash expenses and replacement	43.51
Economic costs:	
Variable expenses	236.70
General farm overhead	21.37
Taxes and insurance	7.51
Capital replacement	50.98
Allocated returns to owned inputs:	
Return to operating capital	7.62
Return to other nonland capital	16.49
Net land rent	69.57
Labor (paid and unpaid) 2/	22.54
Total, economic costs	432.78
Residual returns to management and risk	-2.71
Net returns to owned inputs	113.51
	Unit
Harvest period price (dollars/lb.)	.57
Yield (lbs./planted acre)	690.20

1/ Includes operator and landlord expenses or costs. 2/ Hired labor (a cash expense) and unpaid labor could not be separately identified given available survey data.

Source: (3).

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Appendix table 13--Cotton production costs, Mississippi, 1982 1/

Item	1982
	Dollars per planted acre
Cash receipts:	
Primary crop	494.21
Secondary crop	41.60
Total	535.81
Cash expenses:	
Seed	5.50
Fertilizer	29.57
Lime and gypsum	3.43
Chemicals	102.80
Custom operations	7.64
Fuel and lubrication	34.09
Repairs	21.10
Ginning	63.37
Miscellaneous	4.03
Management fees	3.94
Total, variable expenses	275.47
General farm overhead	26.63
Taxes and insurance	8.75
Interest	87.23
Total, fixed expenses	122.61
Total, cash expenses	398.08
Receipts less cash expenses	137.73
Capital replacement	55.12
Receipts less cash expenses and replacement	82.61
Economic costs:	
Variable expenses	275.47
General farm overhead	26.63
Taxes and insurance	8.75
Capital replacement	55.12
Allocated returns to owned inputs:	
Return to operating capital	8.58
Return to other nonland capital	17.93
Net land rent	59.98
Labor (paid and unpaid) 2/	27.88
Total, economic costs	480.34
Residual returns to management and risk	55.47
Net returns to owned inputs	169.84
	Unit
Harvest period price (dollars/lb.)	.58
Yield (lbs./planted acre)	844.80

1/ Includes operator and landlord expenses or costs. 2/ Hired labor (a cash expense) and unpaid labor could not be separately identified given available survey data.

Source: (3).

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Appendix table 14--Cotton production costs, Missouri, 1982 1/

Item	1982
	Dollars per planted acre
Cash receipts:	
Primary crop	384.02
Secondary crop	31.40
Total	415.42
Cash expenses:	
Seed	7.02
Fertilizer	24.25
Lime and gypsum	.76
Chemicals	23.79
Custom operations	8.08
Fuel and lubrication	24.62
Repairs	19.61
Ginning	52.98
Management fees	.35
Total, variable expenses	161.46
General farm overhead	19.40
Taxes and insurance	11.38
Interest	62.90
Total, fixed expenses	93.68
Total, cash expenses	255.14
Receipts less cash expenses	160.28
Capital replacement	49.53
Receipts less cash expenses and replacement	110.75
Economic costs:	
Variable expenses	161.46
General farm overhead	19.40
Taxes and insurance	11.38
Capital replacement	49.53
Allocated returns to owned inputs:	
Return to operating capital	4.22
Return to other nonland capital	15.77
Net land rent	82.92
Labor (paid and unpaid) 2/	25.91
Total, economic costs	370.59
Residual returns to management and risk	44.83
Net returns to owned inputs	173.65
	Unit
Harvest period price (dollars/lb.)	.60
Yield (lbs./planted acre)	635.80

1/ Includes operator and landlord expenses or costs. 2/ Hired labor (a cash expense) and unpaid labor could not be separately identified given available survey data.

Source: (3).

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Appendix table 15--Cotton production costs, Tennessee, 1982 1/

Item	1982
	Dollars per planted acre
Cash receipts:	
Primary crop	361.09
Secondary crop	34.52
Total	395.61
Cash expenses:	
Seed	6.76
Fertilizer	42.20
Lime and gypsum	.78
Chemicals	25.36
Custom operations	14.65
Fuel and lubrication	22.85
Repairs	22.96
Ginning	44.13
Miscellaneous	.66
Management fees	.52
Total, variable expenses	180.87
General farm overhead	19.19
Taxes and insurance	9.21
Interest	73.43
Total, fixed expenses	101.83
Total, cash expenses	282.70
Receipts less cash expenses	112.91
Capital replacement	46.17
Receipts less cash expenses and replacement	66.74
Economic costs:	
Variable expenses	180.87
General farm overhead	19.19
Taxes and insurance	9.21
Capital replacement	46.17
Allocated returns to owned inputs:	
Return to operating capital	5.17
Return to other nonland capital	15.37
Net land rent	55.15
Labor (paid and unpaid) 2/	19.03
Total, economic costs	350.16
Residual returns to management and risk	45.45
Net returns to owned inputs	140.17
	Unit
Harvest period price (dollars/lb.)	.58
Yield (lbs./planted acre)	625.80

1/ Includes operator and landlord expenses or costs. 2/ Hired labor (a cash expense) and unpaid labor could not be separately identified given available survey data.

Source: (3).

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Appendix table 16--Cotton production costs, Oklahoma irrigated, 1982 1/

Item	1982
	Dollars per planted acre
Cash receipts:	
Primary crop	224.51
Secondary crop	27.28
Total	251.79
Cash expenses:	
Seed	8.43
Fertilizer	17.83
Chemicals	38.08
Custom operations	14.86
Fuel and lubrication	33.36
Repairs	23.90
Purchased irrigated water	9.56
Ginning	46.24
Miscellaneous	1.25
Total, variable expenses	193.51
General farm overhead	13.74
Taxes and insurance	8.05
Interest	32.96
Total, fixed expenses	54.79
Total, cash expenses	248.30
Receipts less cash expenses	3.49
Capital replacement	45.64
Receipts less cash expenses and replacement	-42.15
Economic costs:	
Variable expenses	193.51
General farm overhead	13.78
Taxes and insurance	8.05
Capital replacement	45.64
Allocated returns to owned inputs:	
Return to operating capital	6.97
Return to other nonland capital	15.92
Net land rent	42.22
Labor (paid and unpaid) 2/	33.20
Total, economic costs	359.29
Residual returns to management and risk	-107.50
Net returns to owned inputs	-9.19
	Unit
Harvest period price (dollars/lb.)	.48
Yield (lbs./planted acre)	468.70

1/ Includes operator and landlord expenses or costs. 2/ Hired labor (a cash expense) and unpaid labor could not be separately identified given available survey data.

Source: (3).

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Appendix table 17--Cotton production costs, Oklahoma dryland, 1982 1/

Item	1982
	Dollars per planted acre
Cash receipts:	
Primary crop	90.15
Secondary crop	10.97
Total	101.12
Cash expenses:	
Seed	7.25
Fertilizer	6.04
Chemicals	7.35
Custom operations	3.86
Fuel and lubrication	14.73
Repairs	9.21
Ginning	18.54
Total, variable expenses	66.98
General farm overhead	5.53
Taxes and insurance	4.42
Interest	13.23
Total, fixed expenses	23.18
Total, cash expenses	90.16
Receipts less cash expenses	10.96
Capital replacement	17.64
Receipts less cash expenses and replacement	-6.68
Economic costs:	
Variable expenses	66.98
General farm overhead	5.53
Taxes and insurance	4.42
Capital replacement	17.64
Allocated returns to owned inputs:	
Return to operating capital	2.94
Return to other nonland capital	6.07
Net land rent	20.56
Labor (paid and unpaid) 2/	18.53
Total, economic costs	142.67
Residual returns to management and risk	-41.55
Net returns to owned inputs	6.55
	Unit
Harvest period price (dollars/lb.)	.48
Yield (lbs./planted acre)	188.20

1/ Includes operator and landlord expenses or costs. 2/ Hired labor (a cash expense) and unpaid labor could not be separately identified given available survey data.

Source: (3).

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Appendix table 18--Cotton production costs, Texas irrigated, 1982 1/

Item	1982
	Dollars per planted acre
Cash receipts:	
Primary crop	172.16
Secondary crop	23.63
Total	195.79
Cash expenses:	
Seed	11.45
Fertilizer	15.63
Lime and gypsum	33.96
Chemicals	10.94
Custom operations	46.08
Fuel and lubrication	21.92
Repairs	3.39
Ginning	34.27
Total, variable expenses	177.64
General farm overhead	10.71
Taxes and insurance	4.46
Interest	25.63
Total, fixed expenses	41.30
Total, cash expenses	218.94
Receipts less cash expenses	-23.15
Capital replacement	45.20
Receipts less cash expenses and replacement	-68.35
Economic costs:	
Variable expenses	177.64
General farm overhead	10.71
Taxes and insurance	4.96
Capital replacement	45.20
Allocated returns to owned inputs:	
Return to operating capital	7.25
Return to other nonland capital	15.63
Net land rent	23.91
Labor (paid and unpaid) 2/	34.69
Total, economic costs	319.99
Residual returns to management and risk	-124.20
Net returns to owned inputs	-42.72
	Unit
Harvest period price (dollars/lb.)	.51
Yield (lbs./planted acre)	335.60

1/ Includes operator and landlord expenses or costs. 2/ Hired labor (a cash expense) and unpaid labor could not be separately identified given available survey data.

Source: (3).

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Appendix table 19--Cotton production costs, Texas dryland, 1982 1/

Item	1982
	Dollars per planted acre
Cash receipts:	
Primary crop	122.86
Secondary crop	16.86
Total	139.72
Cash expenses:	
Seed	10.04
Fertilizer	8.25
Chemicals	17.51
Custom operations	4.95
Fuel and lubrication	19.66
Repairs	12.01
Ginning	24.48
Miscellaneous	.21
Total, variable expenses	97.11
General farm overhead	7.64
Taxes and insurance	5.48
Interest	18.29
Total, fixed expenses	31.41
Total, cash expenses	128.52
Receipts less cash expenses	11.20
Capital replacement	23.77
Receipts less cash expenses and replacement	-12.57
Economic costs:	
Variable expenses	97.11
General farm overhead	7.64
Taxes and insurance	5.48
Capital replacement	23.77
Allocated returns to owned inputs:	
Return to operating capital	4.05
Return to other nonland capital	8.03
Net land rent	25.95
Labor (paid and unpaid) 2/	21.22
Total, economic costs	193.25
Residual returns to management and risk	-53.53
Net returns to owned inputs	5.72
	Unit
Harvest period price (dollars/lb.)	.51
Yield (lbs./planted acre)	239.50

1/ Includes operator and landlord expenses or costs. 2/ Hired labor (a cash expense) and unpaid labor could not be separately identified given available survey data.

Source: (3).

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Appendix table 20--Cotton production costs, Arizona irrigated, 1982 1/

Item	1982
	Dollars per planted acre
Cash receipts:	
Primary crop	671.55
Secondary crop	77.98
Total	749.53
Cash expenses:	
Seed	7.08
Fertilizer	52.88
Chemicals	94.07
Custom operations	47.89
Fuel and lubrication	127.27
Repairs	40.67
Purchased irrigated water	25.15
Ginning	97.96
Management fees	3.93
Total, variable expenses	496.90
General farm overhead	46.47
Taxes and insurance	22.35
Interest	136.88
Total, fixed expenses	205.70
Total, cash expenses	702.60
Receipts less cash expenses	46.93
Capital replacement	90.60
Receipts less cash expenses and replacement	-43.67
Economic costs:	
Variable expenses	496.90
General farm overhead	46.47
Taxes and insurance	22.35
Capital replacement	90.60
Allocated returns to owned inputs:	
Return to operating capital	18.58
Return to other nonland capital	29.98
Net land rent	106.70
Labor (paid and unpaid) 2/	69.82
Total, economic costs	881.40
Residual returns to management and risk	-131.87
Net returns to owned inputs	93.21
	Unit
Harvest period price (dollars/lb.)	.61
Yield (lbs./planted acre)	1097.30

1/ Includes operator and landlord expenses or costs. 2/ Hired labor (a cash expense) and unpaid labor could not be separately identified given available survey data.

Source: (3).

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Appendix table 21--Cotton production costs, California irrigated, 1982 1/

Item	1982
	Dollars per planted acre
Cash receipts:	
Primary crop	673.41
Secondary crop	82.24
Total	755.65
Cash expenses:	
Seed	7.91
Fertilizer	59.49
Lime and gypsum	2.31
Chemicals	57.40
Custom operations	53.84
Fuel and lubrication	57.55
Repairs	25.19
Purchased irrigation water	35.59
Ginning	108.18
Miscellaneous	3.30
Management fees	4.03
Total, variable expenses	414.79
General farm overhead	79.87
Taxes and insurance	22.12
Interest	127.47
Total, fixed expenses	229.46
Total, cash expenses	644.25
Receipts less cash expenses	111.40
Capital replacement	54.45
Receipts less cash expenses and replacement	56.95
Economic costs:	
Variable expenses	414.79
General farm overhead	79.87
Taxes and insurance	22.12
Capital replacement	54.45
Allocated returns to owned inputs:	
Return to operating capital	15.88
Return to other nonland capital	17.69
Net land rent	141.60
Labor (paid and unpaid) 2/	67.01
Total, economic costs	813.41
Residual returns to management and risk	-57.76
Net returns to owned inputs	184.42
	Unit
Harvest period price (dollars/lb.)	.63
Yield (lbs./planted acre)	1068.90

1/ Includes operator and landlord expenses or costs. 2/ Hired labor (a cash expense) and unpaid labor could not be separately identified given available survey data.

Source: (3).

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